Brazil: Renewable Energy Sector

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Summary

Brazil's electrical system is divided into two parts, the isolated and interconnected systems. The interconnected system represents 98% of the electricity market while the isolated system contains the remaining 2% and is concentrated in the northwestern part of the country, the Amazon region. As of November 2008, Brazil had 1,768 plants in operation, which corresponds to an installed capacity of 104,816 MW (megawatts), not including theBrazilian/Paraguayan Itaipu plant. In total, Brazil has 1,042 thermoelectric (UTEs ; natural gas, biomass, diesel and fuel oil) plants, 159 central hydropower systems (UHEs), 227 small hydroelectric plants (PHCs), 320 small central hydroelectric exchangers (HMEs), two nuclear generators (UTN) and one solar plant (SOL).
See updated numbers in table below:

Power Plants in Operation							
Type		**Installed Capacity**		**%**	**Total**		**%**
		Qty of Plants	**(kW)**		**Qty of Plants**	**(kW)**	
Hydro		795	77851007	69.18	795	77851007	69.18
Gas	Natural	90	10599802	9.42	121	11844285	10.53
	Processed	31	1244483	1.11			
Oil	Diesel	764	3979882	3.54	784	5271076	4.69
	Residual	20	1265194	1.15			
Biomass	Sugar Cane Bagasse	269	4016178	3.57	329	5516243	4.9
	Black Liquor	14	1145798	1.02			
	Wood Waste	32	265017	0.24			
	Biogas	7	41842	0.04			
	Rice Hull	7	31408	0.03			
Nuclear		2	2007000	1.78	2	2007000	1.78
Mineral Coal		8	1455104	1.29	8	1455104	1.29
Wind		33	414480	0.37	33	414480	0.37
Imports	Paraguay		5650000	5.46		8170000	7.26
	Argentina		2250000	2.17			
	Venezuela		200000	0.19			
	Uruguay		70000	0.07			
Total		**2072**	**112487195**	**100**	**2072**	**112529195**	**100**

Source: ANEEL July 7, 2009

The Eletrobrás System, a series of six state-owned subsidiary companies, is responsible for 38% of Brazil's electricity generation and 56% of electrical transmission. These companies control 30 hydroelectric, 15 thermoelectric and two nuclear plants throughout Brazil.

As Brazil continues this growth trajectory, its advances in the renewable energy sector can be seen as a model for other countries interested in diversifying their energy portfolios. Brazil is the world leader in renewable energy, receiving over 46% of its energy from hydroelectric and other renewable sources.

Brazil accounted for over 90% of renewable energy investment in Latin America in 2008 and the Brazilian Development Bank (BNDES) was the year's largest provider globally of renewable energy project finance. Total financial investment in Brazil was $10.8 billion in 2008, an increase of 76% from 2007. Ethanol continues to dominate investment in Brazil, representing 70% of new renewable energy investment in the country.

Even beyond ethanol, the renewable energy sector in Brazil holds enormous potential for development over the next few years, given the country's wealth of natural resources for wind, biomass, solar and hydro projects, the Brazilian government's Incentive Program for Alternative Electric Energy Sources (PROINFA), and the regular power generation auctions that are held every year.

Market Highlights

Due to an expected 4% annual rise in electricity consumption over the next 25 years, new energy investments are estimated to reach approximately US$800 billion by 2030, according to Brazil's long-term National Energy Plan (PNE). Approximately 130 projects are currently under construction and 469 have been approved, which will allow for an additional 33,800 MW of installed capacity in the country in the coming years.

The expansion of Brazil's electricity sector is focused on diversifying the national energy matrix away from the historical dependence on hydropower. One of the main purposes for this diversification is to reduce the dependency ratio between volume produced and rainfall level. A few years ago, the hydroelectric power accounted for about 90% of installed capacity in the country. In 2008, this participation declined to about 74% due to the construction of power plants based on other sources such as thermoelectric (natural gas and biomass).

Electric Energy Market (Generation/Transmission/Distribution)			
(in US$ millions)	**2007**	**2008**	**2009***
Market Size	$5,171	$6,120	$6,133
Local Production	$5,440	$6,487	$6,487
Exports	$657.2	$864.9	$793.4
Imports (Global)	$388.3	$498.1	$439.7
Imports (US)	(14%)	(13%)	(16%)
Exchange Rate: R$1.91 =US$1.00 *estimated using January – May 2009 data			

Source: ABINEE Panorama Econômico 2009

The PNE, published by Brazil's Energy Research Company (EPE), estimates that new power projects could add 88,000 MW of central hydro power (mostly in the Amazon region), 7,200 MW of small hydro, 4,600 MW of wind power, 6,300 MW of biofuel and 1,300 MW of waste to energy projects across the country by 2030. The 2009 estimate for Brazil's electric energy market (generation, transmission and distribution) is US$6.1 billion, of which US$439.7 million is imported globally with 16% coming from the United States. These figures are based on the Brazilian Electrical and Electronics Industry Association (ABINEE)'s statistics. Other power related trade associations do not release their local industry's production figures. Likewise, the power companies' associations do not publish their members' consolidated equipment imports; hence, the market sizes noted in this table are likely underestimated due to the lack of sufficient data.

Since the worsening international crisis in September 2008, the performance of the sector began to decline in light of falling economic activity in Brazil and worldwide. Until the 3rd quarter of 2008, the industry showed significant rates of growth. Areas related to capital goods and investments in infrastructure maintained reasonable levels based on orders made before September 2008.

Regulations

PROINFA

Established by Law 10.438 in April 2002, the Ministry of Mines and Energy (MME) launched the "PROINFA" Renewable Energy program to promote the expansion of renewable energy in general and specifically encourage the growth of domestic renewable energy industries.

The first phase provided various incentives, such as a 20-year power purchase contract with Eletrobrás, and below-market rates for financing from Brazil's National Development Bank (BNDES) for wind, biomass and small-scale hydroelectric projects; however, the Brazilian Government changed the PROINFA format during its second phase.

The PROINFA program currently provides for the operation of 144 plants, totaling 3,299.40 MW of installed capacity. The 3299.40 MW worth of contracts are divided among: 1191.24 MW in 63 small hydroelectric plants exchangers (HMEs), 1422.92 MW in 54 wind power plants, and 685.24 MW in 27 biomass-based plants. These renewable energy projects are now contracted through specific power auctions. The last one was held in June 2007. The ministry offers new power concessions to private agents with complete feasibility studies and environmental licenses. Each new generation

contract, to be decided as part of multi-year government budget plan, will be granted to the bidders who offer the lowest price, with concessions lasting at least 15 years. Note that only wind, biomass, and small hydro plants are included in the PROINFA program.

Luz Para Todos

Established by Decree No. 4873 in November 2003, and amended by Decree No. 6442 in April 2008, the MME launched Brazil's "Light for All" Program to provide access to electricity to the entire rural Brazilian population by the year 2010 and a fully interconnected national electrical system by 2016.

Since the majority of the rural population does not have access to the power grid, Eletrobras has coordinated with the German development agency GTZ to develop sustainable models of rural electrification using renewable energies. A pilot photovoltaic solar system is being installed in the state of Acre and a pilot hybrid system in the state of Pará. The Pará system will incorporate mini-networks of energy generation, utilizing photovoltaic solar, wind turbines, small hydro, biomass, and/or waste-to-energy systems as appropriate.

The MME and ANEEL will use the results from these two pilot programs to implement policy changes based on the conditions available in remote rural areas.

PROCEL

The National Program of Energy Conservation (PROCEL) promotes increasing energy efficiency with the aim of combating waste and reducing costs in the investment sector. Established in 1993 by Eletrobrás, the Global Reversion Reserve (RGR) and international entities, Procel has helped save 28.5 million MWh and approximately U.S. $ 19.9 billion. The objective is to stimulate the manufacturing and marketing of more efficient products tht will contribute to technological development and reduce environmental impacts. The use of solar energy for residential water heating is one of the primary initiatives embraced by PROCEL, since it was shown that the maximum solar heating is closely related to peak-hour demands and total energy consumption; therefore, the GoB is promoting large-scale use of solar water heating systems through the program.

PROREN

The state of Rio de Janeiro launched ProRen, the "Program of Rationalization of the Use of Energy" on August 12, 2008 to ensure energy efficiency and reduce environmental impacts. The program will encourage new plants in the state of Rio to manufacture solar collectors and wind power equipment. Through PROREN, and in connection with federal government's Growth Acceleration Program (PAC), Rio's Energy Secretariat plans to install solar collectors for heating water in 416 residences in the poor communities of Manguinhos.

Recent Resolution(s)

In order to create incentives for increased foreign investment in the small hydropower sector, ANEEL has introduced a number of resolutions:

- Law 9074(1995) and 9427 (1996) – authorization to explore hydroelectric potential with no requirement to pay a bonus or concession fee to the government;
- Law 10438 (2002) and Resolution 281 (1999), 219 (2003) – up to 50% discounts in usage charges for transmission/distribution systems;
- Law 9648 (1998) and 10438 (2002) – free energy trading with consumers or interested parties with demand at or above 500 KW;
- Law 7990 (1989) and 9427 (1996) – exempted payment for use of water sources;
- Law 9991 (2000) – exemption of requirement that 1% of net operating revenues be devoted to research and development in the electric sector.

An ANEEL resolution in effect since January 2008 allows consumers with a power demand of 500KW or higher to buy power from all renewable sources in the non-regulated market. Consumer incentives include a 50% discount in the power distribution tariff. This measure is expected to expand consumer demand for renewable power plants.

The MME passed Resolution 36 on November 26, 2008 to create a working group for distributing electricity from solar photovoltaic systems. The goal is to propose a new policy to incorporate photovoltaic power generation to the power grid, specifically in urban centers. The working group will identify costs, suppliers, and propose specific taxation for PV systems.

The EPE passed Resolution 242 on June 26, 2009. This resolution modifies the equipment import criteria for wind power generators (HS code number 8502.31.00) for the November 2009 power auction. Turbines with a capacity equal to or below 2.6 MW are subject to a 14% import duty, but are exempt from ad valorem (ICMS) taxes. An exception was made for turbines with a capacity above 2.6 MW, exempting them from this import duty. However, they are then subject to the ad valorem (ICMS) tax. ICMS tax is 19% for Rio de Janeiro, but varies according to state. This exception is subject to re-evaluation on December 21, 2009. The following additional taxes apply to both cases: social contribution tax (PIS/PASEP) of 1.65% and social security contribution tax (COFINS) of 7.6%.

Renewable Power Auctions

The MME and the Brazilian Energy Research Corporation (EPE) changed Brazil's electrical power model in 2004 and began using power generation auctions to distribute government contracts. The MME increased the amount of power that distribution companies (DISCOs) have to buy under contract to 100% of anticipated demand up from 95%, and instead of buying power through bilaterally-negotiated contracts for varying lengths of time, they had to buy in government-organized auctions for set periods of eight years. They also can no longer generate up to 30% of their own power needs, as the previous regulations allowed them to do. (Note:

previously a DISCO was allowed to generate and supply power to its group of companies).

All distributors in Brazil have to participate in the auctions, buying power from generators as a collective pool rather than as individual organizations, so that they end up purchasing the same product at the same price for the same period as all other distributors. Pricing risk thus disappears, and the only way in which a distributor may eventually pay more or less than another distributor is if calculations for future power requirements prove inaccurate. These demand predictions are made five years in advance, and in the event of distributors needing more power than originally anticipated - - within a 3% margin of error – they are allowed to take part in adjustment auctions up to three years before initial delivery. Remaining deficits, as well as surpluses, are traded in one-month contracts in the power trading chamber (CCEE).

The ministry offers power concessions to private agents with complete feasibility studies and environmental licenses. Each new contract, to be decided as part of a multi-year government budget plan, will be granted to the bidders who offer the lowest price (concessions last at least 15 years).

Recent Auctions

The EPE has sponsored 12 different power auctions since 2005, from a wide range of energy sources. A majority of the auctions are hydro and thermal-sourced, with the recent addition of wind to Brazil's energy matrix. See below for the results of the most recent auctions:

Alternative Source Auction June 18,2007		
Source	**Potential**	**Price**
Biomass (sugar cane bagasse)	511.9 MW	US$ 72.70 /MWh
Biomass (other organic waste)	30 MW	
Small Hydro	96.74 MW	US$ 70.68 /MWh
Total/Average	**638.64 MW**	**US$ 71.90/MWh**
Biomass Auction August 14, 2008		
Source	**Potential**	**Price**
Biomass (sugar cane bagasse and varied grasses)	2379.40 MW	US$ 30.81/MWh
Total/Average	**2379.40 MW**	**US$ 30.81/MWh**
A-3 Auction for New Energy in 2011 September 17, 2008		
Source	**Potential**	**Guarantee (avg. MW)**
Wind	2,578.8 MW	89.70 MW

Biomass – Sugar Cane Bagasse	2,217.4 MW	890.90 MW
Biomass - Others	250 MW	205.90 MW
Thermal – Processed Gas	504 MW	272.00 MW
Thermal – Natural Gas	65.9 MW	33.10 MW
Thermal – B1 Fuel Oil	15,016.7 MW	7,830.70 MW
Total	**20,632.8 MW**	**10,126.30 MW**

A-5 Auction for New Energy in 2013 September 30, 2008		
Source	**Potential**	**Price**
Hydro	121	US$ 51.82/MWh
Biomass – Sugar Cane Bagasse	35	US$ 75.92/MWh
Imported Mineral Coal	276	US$ 73.30/MWh
Thermal – B1 Fuel Oil	1990	US$ 76.36/MWh
Thermal – Processed Gas	703	US$ 76.11/MWh
Total/Average	**3125**	**US$ 74.23/MWh**

Source: EPE (http://www.epe.gov.br/leiloes/Paginas/default.aspx)

The government purchased 31 sugarcane bagasse cogeneration plants in the 2008 biomass auction; however, due to the recent constriction of financial markets, 30-40% of these projects run the risk of not complying with their contracts and failing to meet their production levels on time. This could temporarily diminish investment in the sector.

Future Auctions

New Energy A-3 Auction August 27, 2009		
Source	**Plants**	**Potential**
Hydro (repotential)	2	20 MW
Small Hydro	31	390 MW
Biomass – Sugar Cane Bagasse	20	995 MW
Biomass – Other	3	93 MW
Thermal – Processed Gas	1	42 MW
Thermal – Natural Gas	54	11.344 MW
Thermal – BI Fuel Oil	8	1.477 MW
Total	**119**	**14,362MW**

Reserve Auction – Wind November 25, 2009		
State	**Plants**	**Potential**
Bahia	51	1,575
Ceará	118	2,743
Espírito Santo	6	153

Paraíba	1	20
Paraná	23	625
Piauí	16	413
Rio de Janeiro	2	45
Rio Grande do Norte	134	4,745
Rio Grande do Sul	86	2,894
Santa Catarina	2	75
Sergipe	2	54
Total	441	13,341

Source: EPE
(http://www.epe.gov.br/leiloes/Paginas/default.aspx)

On November 25, 2009, the EPE will hold the country's first wind energy auction. The EPE announced 441 registered projects, with 13,341 MW of generation capacity. Unlike previous renewable energy auctions (where small firms were the primary participants), Brazil's first wind auction will be dominated by major Brazilian and international energy groups, including subsidiaries of Petrobras Eletrobras, Cemig and CPFL. Global wind power market leaders, such as the Portuguese EDP, EDP Renewables by Brazil (EDPBR), and the Spanish Iberdrola, are also expected to attend. 73% of the registered projects (332 firms) and 72% of the total generation potential (9,549 MW) are located in northeastern Brazil, while 25% of the registered projects (111 firms) were from the southern region (3,594 MW). Many participating wind farms operate between 25 and 50 MW capacities, but six large projects (each exceeding 100 MW) have also registered, representing a capacity of 806 MW.

In response to recent contractual problems from the past biomass auction, the EPE plans to enforce severe penalties for those who do not fulfill the terms of their contracts by failing to meet either their deadlines or energy quotas. Only companies with significant investment in specialized and qualified projects will be able to manage these risks.

This auction has attracted so many large companies largely due to the diminishing growth of new hydroelectric projects in the country, as the Brazilian government has begun to shift its priorities to other sectors. The global wind market is a new high-growth energy technology, having grown by 25% between 2007 and 2008 to reach a capacity of 152 GW.

Petrobras has also indicated that they may open bidding for solar equipment in January 2010. Petrobras is Brazil's largest energy consumer and producer, consuming ten percent of its own energy production. Currently, Petrobras has three divisions dealing with energy efficiency: one that oversees its internal energy consumption; another for Petrobras' consumers (ConPet), and a new one focused on carbon credits.

Petrobras is using solar power to reduce energy consumption in its offices and refineries. The company has installed 2,180m^2 of solar collectors that generate a savings of 1.23GWh/year. In two years, the company aims to have 9,765m^2 of solar collectors

saving 2.63GWh/year. Petrobras plans to increase solar energy in its facilities as long as it proves profitable, and to open a tender to procure new solar equipment soon.

End User Profile

Installed Power Generation Capacity				
Companies	Installed Capacity – MW Hydropower	Installed Capacity – MW Thermal Power	Installed Capacity – MW Wind Power	Total Installed Capacity
AES TIETÊ	2.651	0	-	2.651
ENDESA CACHOEIRA	658	0	-	658
CEMIG	6.251	131	-	6.382
CESP	7.455	0	-	7.455
CEEE	921	0	-	921
DUKE-GP	2.228	0	-	2.228
CHESF	10.440	502	-	10.942
COPEL	4.518	20	-	4.538
ELETRONORTE	7784	922	-	8706
EMAE	922	472	-	1.394
FURNAS	8.978	796	-	9.774
LIGHT	858	0	-	858
TRACTEBEL ENERGIA	5.175	1.213	44	6.432
Total ABRAGE Companies	58.839	4.056	44	62.939
Total National Grid, including 50% of Itaipu Dam Generation (Data from ONS - 31/12/2008)				92.303 MW

Source: ABRAGE (Brazilian Association of Power Generators)

2008 Electricity Rates – Average Tariff By Consumer Category						
Consumer	**Energy**	**Energy Revenue**	**Energy Revenue**	**Number**	**Average**	**Average**
Residential	95.795.460	R$	US$13,525,059,665	53,897,043	R$	US$141.19
Industrial	79.724.524	R$	US$7,960,506,117	527,996	R$	US$108.33
Commercial,	60.868.861	R$	US$8,264,084,289	4,640,902	R$	US$136.81
Agriculture	14.212.854	R$	US$1,273,153,990.00	3,371,548	R$	US$89.58
Public Power	11.511.846	R$	US$1,706,303,689.00	473,894	R$	US$148.22
Public	11.431.568	R$	US$907,939,914.60	65,515	R$	US$79.43
Public	10.796.402	R$	US$1,054,256,424.00	60,057	R$	US$97.65
Consumption	668.471	R$ 170,046,367.80	US$85,126,232.00	7,956	R$ 276.31	US$138.32

2008 Electricity Rates – Average Tariff By Consumer Category						
Consumer Category	**Energy Consumption MWh**	**Energy Revenue (IN REAIS)**	**Energy Revenue (IN USD)**	**Number of Consumer Units**	**Average Tariff (IN REAIS)**	**Average Tariff (IN USD)**
Residential	95.795.460	R$ 27,017,374,271.69	US$13,525,059,665	53,897,043	R$ 282.03	US$141.19
Industrial	79.724.524	R$ 15,901,739,326.43	US$7,960,506,117	527,996	R$ 216.39	US$108.33
Commercial, Services, Others	60.868.861	R$ 16,508,160,687.81	US$8,264,084,289	4,640,902	R$ 273.28	US$136.81
Agriculture	14.212.854	R$ 2,543,225,591.26	US$1,273,153,990.00	3,371,548	R$ 178.94	US$89.58
Public Power	11.511.846	R$ 3,408,476,304.65	US$1,706,303,689.00	473,894	R$ 296.08	US$148.22
Public Lighting	11.431.568	R$ 1,813,681,646.99	US$907,939,914.60	65,515	R$ 158.66	US$79.43
Public Services	10.796.402	R$ 2,105,960,424.21	US$1,054,256,424.00	60,057	R$ 195.06	US$97.65
Consumption	668.471	R$ 170,046,367.80	US$85,126,232.00	7,956	R$ 276.31	US$138.32
Acquaculture	103.764	R$ 12,745,199.25	US$6,380,323.22	624	R$ 122.83	US$61.49
Irrigation	3.777.087	R$ 525,286,888.43	US$262,961,768.10	42,856	R$ 139.07	US$69.62
Total	**288.890.838**	**R$ 70,006,696,708.52**	**US$35,045,772,412.00**	**63,088,391**	**R$ 213.87**	**US$107.06**

Source: ANEEL July 9, 2009

Wind Power

According to the U.S. Energy Information Administration (EIA), a bureau at the U.S. Department of Energy, the wind energy market should continue to grow by approximately 20% annually until 2030. Recent calculations by the Brazilian Wind Atlas find that Brazil has a current wind potential of 143 GW, a little lower than Brazil's current entire generating capacity (143,086 MW) though sector experts claim Brazil's potential could reach up to 300 GW. This growth trend mirrors international developments, as worldwide wind power generation capacity has grown by over 90% in the last ten years.

Brazil has long thought that solar and wind technologies were cost prohibitive and not practical for the Brazilian market; however, Brazilian Deputy Minister of Mines and Energy Marcio Zimmermann visited the U.S. National Renewable Energy Laboratory in

June 2009. At that time he indicated that new U.S. technologies could be commercially viable in Brazil, indicating a shift from viewing the wind energy industry as a heavily subsidized effort to now one viable enough to compete on the open market.

In view of expected growth in the wind segment in Brazil, and the likelihood that the Brazilian government will continue to require minimum local equipment contents for the projects (e.g. about 60-70% of the total value of each installed project), foreign wind power equipment manufacturers Enercon (Germany), Vestas (Denmark) and Impsa (Argentina) have opened plants in Brazil. The Spanish company Gonvarri is reportedly considering a launch in Brazil. GE and Siemens may also expand their wind portfolio in Brazil, since they already manufacture several other types of equipment for Brazil's infrastructure sector. Foreign power producers such as the Portuguese EDP, the Spanish Iberdrola, French Tractebel-Suez, and the U.S. AES are reportedly interested in increasing their wind power activities in Brazil, in addition to Brazilian groups Cemig, MPX, CPFL, the national energy company Petrobras.

There are 33 small wind-power plants operating in Brazil, mostly concentrated in the states of Ceará and Rio Grande do Sul. As of July 2009, Brazil's wind power installed capacity had reached 417.5 MW, placing Brazil 24th in world wind power capacity, with an additional 12 power plants under construction and 48 under permit process. If all of them move forward, generation capacity should reach 3,160 MW. The government expects to award at least another 1,000 MW of new power through the November 25, 2009 auction.

The following table shows the wind power plants that are in operation, construction and permit process:

Wind Plants in Operation			
Plant	**Capacity (KW)**	**Project Sponsors**	**Location**
Eólica de Prainha	10000	100% for Wobben Wind Power Industria e Comércio Ltda	Aquiraz - CE
Eólica de Taíba	5000	100% for Wobben Wind Power Industria e Comércio Ltda	São Gonçalo do Amarante - CE
Eólica-Elétrica Experimental do Morro do Camelinho	1000	100% for CEMIG Geração e Transmissão S/A	Gouveia - MG
Eólio - Elétrica de Palmas	2500	100% for Centrais Eólicas do forná Ltda.	Palmas - PR
Eólica de Fernando de Noronha	225	100% for Centro Brasileiro de Energia Eólica - FADE/UFPE	Fernando de Noronha - PE
Parque Eólico de Beberibe	25600	100% for Usina Eólica Econergy Beberibe S.A.	Beberibe - CE
Mucuripe	2400	100% for Wobben Wind Power Industria e Comércio Ltda	Fortaleza - CE
RN 15 - Rio do Fogo	49300	100% for Energias Renováveis do Brasil S.A.	Rio do Fogo - RN

Eólica de Bom Jardim	600	100% for Parque Eólico de Santa Catarina Ltda	Bom Jardim da Serra - SC
Foz do Rio Choró	25200	100% for SIIF Cinco Geração e Comercialização de Energia S.A.	Beberibe - CE
Eólica Olinda	225	100% for Centro Brasileiro de Energia Eólica - FADE/UFPE	Olinda - PE
Eólica Canoa Quebrada	10500	100% for Rosa dos Ventos Geração e Comercialização de Energia S.A.	Aracati - CE
Lagoa do Mato	3230	100% for Rosa dos Ventos Geração e Comercialização de Energia S.A.	Aracati - CE
Parque Eólico do Horizonte	4800	100% for Central Nacional de Energia Eólica Ltda	Água Doce - SC
Eólica forcuru	23400	100% for Eólica forcuru Geração e Comercialização de Energia S.A.	forcuru - CE
Pedra do Sal	18000	100% for Econergy Pedra do Sal S.A.	Parnaíba - PI
Macau	1800	100% for Petróleo Brasileiro S/A	Macau - RN
Eólica Água Doce	9000	100% for Central Nacional de Energia Eólica Ltda	Água Doce - SC
Parque Eólico de Osório	50000	100% for Ventos do Sul Energia S/A	Osório - RS
Parque Eólico Sangradouro	50000	100% for Ventos do Sul Energia S/A	Osório - RS
Taíba Albatroz	16500	100% for Bons Ventos Geradora de Energia S.A.	São Gonçalo do Amarante - CE
Parque Eólico dos Índios	50000	100% for Ventos do Sul Energia S/A	Osório - RS
Millennium	10200	100% for SPE Millennium Central Geradora Eólica S/A	Mataraca - PB
Presidente	4800	100% for Vales dos Ventos Geradora Eólica S.A	Mataraca - PB
Camurim	4800	100% for Vales dos Ventos Geradora Eólica S.A	Mataraca - PB
Albatroz	4800	100% for Vales dos Ventos Geradora Eólica S.A	Mataraca - PB
Coelhos I	4800	100% for Vales dos Ventos Geradora Eólica S.A	Mataraca - PB
Coelhos III	4800	100% for Vales dos Ventos Geradora Eólica S.A	Mataraca - PB
Atlântica	4800	100% for Vales dos Ventos Geradora Eólica S.A	Mataraca - PB
Caravela	4800	100% for Vales dos Ventos Geradora Eólica S.A	Mataraca - PB
Coelhos II	4800	100% for Vales dos Ventos Geradora Eólica S.A	Mataraca - PB
Coelhos IV	4800	100% for Vales dos Ventos Geradora Eólica S.A	Mataraca - PB
Mataraca	4800	100% for Vales dos Ventos Geradora Eólica S.A	Mataraca - PB
Total Plants: 33 **Total Capacity: 417.5 MW**			

Wind Plants Under Construction			
Plant	**Capacity (KW)**	**Project Sponsors**	**Location**

Praia do Morgado	28800	100% para Central Eólica Praia do Morgado S/A	Acaraú - CE
Volta do Rio	42000	100% para Central Eólica Volta do Rio S/A	Acaraú - CE
Praia Formosa	104400	100% para Eólica Formosa Geração e Comercialização de Energia S.A.	Camocim - CE
Eólica Icaraizinho	54000	100% para Eólica Icaraizinho Geração e Comercialização de Energia S.A.	Amontada - CE
Eólica Praias de Parajuru	28800	100% para Central Eólica Praia de Parajuru S/A	Beberibe - CE
Parque Eólico Enacel	31500	100% para Bons Ventos Geradora de Energia S.A.	Aracati - CE
Canoa Quebrada	57000	100% para Bons Ventos Geradora de Energia S.A.	Aracati - CE
Bons Ventos	50000	100% para Bons Ventos Geradora de Energia S.A.	Aracati - CE
Xavante	4250	100% para Eólica Gravatá - Geradora de Energia S.A.	Pombos - PE
Mandacaru	4250	100% para Eólica Gravatá - Geradora de Energia S.A.	Gravatá - PE
Santa Maria	4250	100% para Eólica Gravatá - Geradora de Energia S.A.	Gravatá - PE
Gravatá Fruitrade	4250	100% para Eólica Gravatá - Geradora de Energia S.A.	Gravatá - PE

Total Plants: 12 Plants
Total Capacity: 413.5 MW

Wind Electrical Generation Plants in Permit Process

Plant	Capacity (KW)	Project Sponsors	Location
Quintanilha Machado I	135000	100% para SIIF Énergies do Brasil Ltda	Arraial do Cabo - RJ
BA 3 - Caetité	192100	100% para Heraklion Participações S/A	Caetité - BA
Maceió	235800	100% para Eólica Maceió Ltda.	Itapipoca - CE
Fazenda Nova	180000	100% para Eólica Fazenda Nova Geração e Comercialização de Energia Ltda.	Porto do Mangue - RN
Redonda	300600	100% para Eólica Redonda Ltda	Icapuí - CE
Pecém	31200	100% para Eólica Pecém Ltda	Caucaia - CE
Alegria II	100800	100% para New Energy Options Geração de Energia S/A	Guamaré - RN
Alegria I	51000	100% para New Energy Options Geração de Energia S/A	Guamaré - RN
Pirauá	4250	100% para Eólica Pirauá - Geradora de Energia S.A.	Macaparana - PE
Fábrica da Wobben Windpower no Pecém	600	100% para Wobben Wind Power Industria e Comércio Ltda	Caucaia - CE
Parque Eólico Ponta do Mel	50400	100% para Compinvest Mercosul - Companhia de Investimentos e Participações do Mercosul S/A	Areia Branca - RN
Parque Eólico Elebrás Santa Vitória do Palmar 1	126000	100% para Elebrás Projetos Ltda	Santa Vitória do Palmar - RS

Parque Eólico Elebrás Cidreira 1	70000	100% para Elebrás Projetos Ltda	Tramandaí - RS
Eólica Ariós	16200	100% para Eletrowind S/A	Beberibe - CE
Gargaú	28050	100% para SeaWest do Brasil Projetos e Participações Ltda	São Francisco de Itabapoana - RJ
Praia do Arrombado	23400	100% para Eletrowind S/A	Luís Correia - PI
Parque Eólico de Palmares	7562	100% para Ventos do Sul Energia S/A	Palmares do Sul - RS
Vale da Esperança	29700	100% para Eletrowind S/A	Touros - RN
Parque Eólico Tainhas I	15000	100% para Energia Regenerativa Brasil Ltda	São Francisco de Paula - RS
Usina Eólica de Laguna	3000	100% para Parque Eólico de Santa Catarina Ltda	Laguna - SC
Santa Marta	46531	100% para Empresa Energética Santa Marta Ltda	Laguna - SC
Parque Eólico Xangri-lá II	6000	100% para Energia Regenerativa Brasil Ltda	Capão da Canoa - RS
Parque Eólico Giruá	11050	100% para Ecoprojeto Ltda	Giruá - RS
Usina Eólica Elétrica UEE Coqueiro	14400	100% para Nova-Sistemas de Energia Ltda	São João da Barra - RJ
Parque Eólico Pinhal	9350	100% para Ecoprojeto Ltda	Palmares do Sul - RS
UEE Maravilha	49600	100% para Nova-Sistemas de Energia Ltda	São Francisco de Itabapoana - RJ
UEE Saco Danta	26400	100% para Nova-Sistemas de Energia Ltda	São João da Barra - RJ
UEE Mundéus	23800	100% para Nova-Sistemas de Energia Ltda	São Francisco de Itabapoana - RJ
Púlpito	30000	100% para Púlpito Energia Eólica S.A.	Bom Jardim da Serra - SC
Aquibatã	30000	100% para Aquibatã Energia Eólica S.A.	Água Doce - SC
Santo Antônio	1930	100% para Santo Antônio Energia Eólica S.A.	Bom Jardim da Serra - SC
Cascata	4800	100% para Cascata Energia Eólica S.A.	Água Doce - SC
Rio do Ouro	30000	100% para Rio de Ouro Energia Eólica S.A.	Bom Jardim da Serra - SC
Salto	30000	100% para Salto Energia Eólica S.A.	Água Doce - SC
Bom Jardim	30000	100% para Bom Jardim Energia Eólica S.A.	Bom Jardim da Serra - SC
Campo Belo	9600	100% para Campo Belo Energia Eólica S.A.	Água Doce - SC
Amparo	21400	100% para Amparo Energia Eólica S.A.	Água Doce - SC
Cruz Alta	30000	100% para Cruz Alta Energia Eólica S.A.	Água Doce - SC
Vitória	4250	100% para Cardus Estratégias Urbanas Ltda	Mataraca - PB
Salina Diamante Branco	200000	100% para Cedin do Brasil Ltda	Galinhos - RN
Alhandra	5400	100% para Cedin do Brasil Ltda	Alhandra - PB

Parque Eólico do Vigia	30000	100% para Água Doce Energia Ltda	Água Doce - SC
Piloto de Rio Grande	4500	100% para Petróleo Brasileiro S/A	Rio Grande - RS
Eólio-Elétrica São Gonçalo	60000	100% para Secretaria de Infra-Estrutura do Governo do Estado do Ceará	São Gonçalo do Amarante - RN
Enerce Pindoretama	4500	100% para ENERCE – Energias Renováveis do Ceará Ltda.	Pindoretama - CE
Aratuá I	14700	100% para Aratuá Central Geradora Eólica S/A	Guamaré - RN
Total Plants: 46 **Total Capacity: 2,329 MW**			

Source: ANEEL July 7, 2009

Renewable-Sourced Biomass Thermoelectricity

In 2008, sugarcane byproducts (ethanol and bagasse) became the second most important source of energy in Brazil (16%), less than oil and its byproducts (37%) but overtaking hydro (15%). New Energy Finance expects that by 2020 Brazilian co-generation projects combining sugarcane bagasse combustion and ethanol refining could generate 15GW of power and account for up to 15% of the country's electricity needs, up from current levels of 2%.

In 2008, investment in Brazilian biofuel plants more than doubled to $6.3 billion from $3.0 billion in 2007. While the international financial crisis has had a significant impact on new projects, many industry leaders do not believe it will have a permanent effect on the industry. Projects that are able to attract financing are still moving forward, and many believe that these postponed projects, while damaging the image of the industry, will not significantly affect Brazil's energy supply in the long term. Adriano Pires, director of the Brazilian Center for Infrastructure, blames the Brazilian government for failing to negotiate more realistic prices during the boom period. He asserts that the crisis in the sugar-alcohol sector is merely circumstantial, and will not continue into the long term.

Under PROINFA, most approved biomass projects are for sugarcane bagasse, but there has also been interest in rice hulls, orange bagasse, wood chips, wood residues and fiber of palm oil kernels. There are 329 biomass plants operating in Brazil (269 burning sugar cane bagasse, 29 burning wood waste, 14 burning black liquor, 7 burning biogas, 7 burning rice hulls and 3 burning vegetable charcoal). These plants have a total production capacity of 6,613 MW. For a detailed list of these plants, their locations and capacities, visit the ANEEL technical information site (updated daily): http://www.aneel.gov.br/aplicacoes/capacidadebrasil/OperacaoGeracaoTipo.asp?tipo=5&ger=Combustivel&principal=Biomassa

The following table shows the Brazilian biomass power plants that are undergoing construction and the permit process:

Thermoelectric Biomass Plants Under Construction				
Plant	**Capacity (KW)**	**Project Sponsors**	**Location**	**Type**
Salvador	19730	100% para Termoverde Salvador S.A.	Salvador - BA	Biogas
CAAL	3825	100% para Cooperativa Agroindustrial Alegrete Ltda	Alegrete - RS	Rice Hulls
Cocamar Maringá	13000	100% para Cocamar Cooperativa Agroindustrial	Maringá - PR	Sugar Cane Bagasse
Frutal	15000	100% para Usina Frutal Açúcar e Álcool S.A.	Frutal - MG	Sugar Cane Bagasse
Iacanga	19000	100% para Usina Iacanga de Açúcar	Iacanga - SP	Sugar Cane Bagasse
Pioneiros II	50000	não identificado	Ilha Solteira - SP	Sugar Cane Bagasse
Unidade de Geração de Energia Elétrica - Agrenco - Mato Grosso	21600	100% para Agrenco Bioenergia Indústria e Comércio de Óleos e Biodiesel Ltda.	Caarapó - MS	Sugar Cane Bagasse
Usina Bonfim	111000	100% para Barra Bioenergia S.A.	Guariba - SP	Sugar Cane Bagasse
Cocal II	160000	100% para Cocal Comércio Indústria Canaã Açúcar e Álcool Ltda	Narandiba - SP	Sugar Cane Bagasse
Total	40000	100% para Total Agroindústria Canavieira S.A.	Bambuí - MG	Sugar Cane Bagasse
Biopav	65000	100% para BIOPAV S.A. AÇÚCAR E ÁLCOOL	Brejo Alegre - SP	Sugar Cane Bagasse
Noroeste Paulista	78000	100% para Usina Noroeste Paulista Ltda.	Sebastianópolis do Sul - SP	Sugar Cane Bagasse
Monções	22000	100% para Virgolino de Oliveira S/A Açúcar e Álcool	Monções - SP	Sugar Cane Bagasse
Usaçúcar - Terra Rica	16500	100% para Usina de Açúcar Santa Terezinha Ltda.	Terra Rica - PR	Sugar Cane Bagasse
Monteverde	40000	100% para Monteverde Agro-Energética S.A.	Ponta Porã - MS	Sugar Cane Bagasse
Porto das Águas	70000	100% para Usina Porto das águas Ltda	Chapadão do Céu - GO	Sugar Cane Bagasse

Source: ANEEL July 7, 2009

Solar Power

Solar power offers enormous development opportunities in Brazil, which has one of the world's most abundant solar energy resources and has only just begun to explore its potential. MME's Deputy Planning Energy Secretary Paulo Leonelli highlighted Brazil's solar potential by region (North: 43.3%; Northeast: 20.5%; Southeast: 10.5%, South: 6.4%). Solar energy is being pursued both in passive heating and photovoltaic (PV) generation through the use of silicon cells, though all current projects are small-scale and experimental at this stage.

During his June 2009 visit to the US, the MME's Vice Minister Marcio Zimmerman made statements indicating that Brazil is considering developing larger-scale solar projects between Eletrobras' Electric Energy Research Center (CEPEL) and Spanish companies, but current interests are mainly focused on the applications for solar-generated energy storage.

Passive Solar Heating
The use of solar water heaters in Brazil has increased rapidly in the last few years, with about 150 Brazilian manufacturers producing these products for residences, hotels, hospitals, and swimming pools. Most are very small companies. Brazil's Ministry of Mines and Energy (MME) has recently proposed a Solar City Network program that will create legislation to make mandatory the use of water heating through solar collectors in new construction projects.

Photovoltaic Electricity
The estimated total installed capacity of PV systems in Brazil is still small. The main PV applications in Brazil have been off-grid residences, public services, water pumping, and telecommunications. PV technology is the only a competitive alternative to grid extension in remote areas of the country and in applications of social interest. According to a 2008 study sponsored by the Brazilian government, the United Nations Environment Program (UNEP), and the Global Environment Facility (GEF), the potential for using PV can be estimated in 10s to 100s of MW in the Amazon region in co-generation projects with diesel oil power plants.

Photovoltaic (PV) power generation is still a costly solution since there is no domestic production of PV modules in Brazil. MPX Energia has announced plans to build a one MW solar project in Ceará to be connected with existing power grid, but the project is still in the early planning stages, including efforts to support a Chinese photovoltaic panel manufacturer opening a plant in Brazil. The MME is also financing solar energy programs to support domestic silicon chain development. Brazil is one of the world's largest silicon producers. Bahia, Pernambuco, and Ceará are the largest silicon producing states. Brazil exports raw (metallurgical) silicon at approximately US$60 per ton, and imports processed, pure and solar grade silicon at about US$600/ton for use in computers, cellular telephones, and solar photovoltaic panels.

However, silicon refining technology is very costly, complex and scarce, and only five companies in the world have profitably developed and marketed this technology. All of these companies are located in the U.S. Silicon Valley, the largest importer of Brazil's raw silicon (according to the Brazilian Renewable Energy Company Association, ABEER).

The following table gives information on the photovoltaic power plant currently in operation and the one under permit process:

Photovoltaic Solar Plants in Operation			
Plant	**Capacity (KW)**	**Project Sponsors**	**Location**
Araras – RO	20480	100% para Fundação de Amparo à Pesquisa e Extensão Universitária	Nova Mamoré – RO
Total Plants: 1 **Total Capacity: 20.5 MW**			
Photovoltaic Solar Plants in Permit Process			
Plant	**Capacity (KW)**	**Project Sponsors**	**Location**
Tauá	5000	100% para ENERCE – Energias Renováveis do Ceará Ltda.	Tauá – CE
Total Plants: 1 **Total Capacity: 5 MW**			

Source: ANEEL July 7, 2009

Waste-to-Energy

While this sector is still in testing phases, waste-to-energy technology could be very effective in Brazil, where 170,000 tons of waste is produced daily and approximately 30% is recycled. The potential energy that could be produced from solid waste in Brazil tops 50 TWh, which is equal to some 17% of the nation's total power consumption, at prices that are competitive with many other more traditional sources. Waste-to-energy technology could also reduce greenhouse gases emissions and open up thousands of jobs for unskilled workers.

Although the operating costs of selective garbage collection for energy generation are higher than traditional generation costs, the net operating revenues of this scheme can reach some US$ 4 billion per year. This creates an opportunity to offset garbage management and environmental costs with energy generation projects. The future success of Brazil's power sector requires the successful integration of fossil and renewable energy sources in order to balance economic, social and environmental demands. Using offsets such as waste-to-energy in combination with thermal power plants will create a new model where energy generation no longer contributes to greenhouse gas emissions.

Waste-to-energy plants are expected to increase in Brazil in view of recent incentives approved by Brazil's power regulator ANEEL. These incentives include lowering power

transmission and power distribution fees. Additionally, the Brazilian government may impose a new environmental license requirement for thermal power projects (e.g. coal, etc.); thereby encouraging companies to consider investments in waste-to-energy plants in anticipation of more stringent environmental rules.

On June 29, 2009, the U.S. Trade and Development Agency (USTDA) awarded a U$406,000 grant to MPX Energia, S.A. to determine the viability of constructing a waste-to-energy plant in the state of Rio de Janeiro. The grant will fund a study on the technical and financial feasibility of constructing a facility that will provide reliable and efficient power generation while helping to reduce the level of municipal solid waste in Rio de Janeiro. The project is expected to offset greenhouse gas emissions from existing landfills by using solid waste to generate electricity, and provide power to approximately 30,000 - 45,000 households. The project, located in the Rio municipality of Cajú, could provide a model for other waste-to-energy plants in the country.

At a meeting with USTDA and the Rio de Janeiro branch of U.S. Commercial Service, Eliane de Almeida Gattass, Manager of the Generation Planning Department at Furnas Central Electric, a subsidiary of Eletrobrás, mentioned that some of its analysts have also been pursuing European waste-to-energy projects.

Best Sales Prospects

Opportunities in the renewable energy generation subsector include power generation services and equipment such as: photovoltaic generators, steam generators, wind turbines (above 1.5 MW), heat exchangers, steam condensers, steam turbines, liquid pumps for PV generation, air cooling systems, heat exchanging units, solar inverters and batteries, as well as their parts.

Competitive Situation

U.S. investment in Brazil's energy sector is concentrated in power distribution and generation as a result of the country's 1996 privatizations. U.S. companies such as El Paso, Duke, AES, and Ashmore Energy International (AEI) compete with Spanish (Iberdrola, Abengoa), French (EDF, Suez) and Portuguese (EDP) companies. The U.S. companies Earth Tech and MDU Resources operate in the power transmission segment. The strongest competition for U.S. generation, transmission and distribution (GTD) equipment suppliers are locally established multinationals (mostly European and Japanese). U.S. companies should note that the federal and state-owned companies controlling this sector often follow "buy local" policies. (Note: U.S. investors with facilities in Brazil are considered local companies).

The following companies are members of the Brazilian Association of Electrical and Electronic Manufacturers (ABINEE). Many of them export from Brazil. They manufacture power generation, transmission and distribution equipment. There are hundreds of small and medium-sized Brazilian companies that specialize in supplying components to these companies. Click on each title for a breakdown of the ABINEE members list and their products in English.

3M DO BRASIL LTDA

ABB LTDA

ADELCO SISTEMAS DE ENERGIA LTDA

ANDRITZ HYDRO BRASIL LTDA

AREVA TRANSM E DISTR DE ENERGIA LTDA

ARTECHE EDC EQUIPAMENTOS E SISTEMAS S/A

BEGHIM INDUSTRIA E COMERCIO S/A

CAS TECNOLOGIA S/A

CEMEC CONSTRUCOES ELETROMECANICAS S/A

CERAMICA SANTA TEREZINHA S/A

CONTROLE ENGENHARIA E INSTALACOES LTDA

CONVERTEAM BRASIL LTDA

COOPER POWER SYSTEMS DO BRASIL LTDA

EATON LTDA CUTLER-HAMMER BLINDEX

EGOM-INSTALACOES E MONTAGENS LTDA

ELECTRO POLO LTDA

ELECTROVIDRO S/A

ELO SISTEMAS ELETRONICOS S/A

ELSTER MEDICAO DE ENERGIA LTDA

ENELTEC ENERGIA ELETRICA E TECNOL LTDA

ENERCON EQUIPAMENTOS E SISTEMAS LTDA

FABRICA DE PECAS ELETRICAS DELMAR LTDA

FAE FERRAGENS E APARELHOS ELETRICOS S/A

FCI BRASIL LTDA

FORJASUL CANOAS S/A IND METALURGICA

FUJIELETRICA IND ELETROMECANICA LTDA

FURUKAWA INDUSTRIAL S/A PRODS ELETRICOS

GENERAL ELECTRIC DO BRASIL LTDA

GRAMEYER EQUIPAMENTOS ELETRONICOS LTDA

GTA ELETRONICA LTDA

GTMS EQUIPAMENTOS ELETRICOS LTDA

HELMUT MAUELL DO BRASIL IND E COM LTDA

ICR INDUSTRIA E COMERCIO DE RELES LTDA

IMS IND MICRO SISTEMAS ELETRONICOS LTDA

INAEL DO BRASIL IND COM MATL ELETR LTDA

INCOTRAZA INDUSTRIA COM TRANSF ZAGO LTDA

INDELT ELETRO ELETRONICA LTDA

INDUSTRIA DE TRANSFORMADORES ITAIPU LTDA

INDUSTRIA ELETRIC MARANGONI MARETTI LTDA

INDUSTRIA ELETROMECANICA BALESTRO LTDA

ISOELECTRIC BRASIL LTDA

ISOLADORES SANTANA S/A

ITB EQUIPAMENTOS ELETRICOS LTDA

ITRON SISTEMAS E TECNOLOGIA LTDA

ITRON SOLUCOES P/ ENERGIA E AGUA LTDA

KOBLITZ S/A

KRAU.S. NAIMER DO BRASIL IND E COM LTDA

KRJ-INDUSTRIA E COMERCIO LTDA

LAELC REATIVOS LTDA

LANDIS+GYR EQUIPAMENTOS DE MEDICAO LTDA

LEON HEIMER S/A

LORENZETTI S/A INDS BRAS ELETROMETALURGI

MAURIZIO & CIA LTDA

MEGABARRE IND EQUIP ELETRICOS LTDA

MR DO BRASIL INDUSTRIA MECANICA LTDA

NANSEN S/A INSTRUMENTOS DE PRECISAO

ORMAZABAL DO BRASIL EQ DIST EN ELET LTDA

ORTENG EQUIPAMENTOS E SISTEMAS LTDA

PAINEL EQUIPAMENTOS ELETRICOS LTDA

PENTAIR TAUNUS ELETROMETALURGICA LTDA

PEXTRON CONTROLES ELETRONICOS LTDA

PHELPS DODGE INTERNATIONAL BRASIL LTDA

PLP-PRODUTOS P/ LINHAS PREFORMADOS LTDA

PORCELANAS INDUSTRIAIS GERMER S/A

POWERBUS EQUIPAMENTOS ELETRICOS LTDA

PROMINS INDUSTRIA ENGENHARIA ELETR LTDA

PRYSMIAN ENERG CABOS SIST DO BRASIL S/A

RITZ DO BRASIL S/A

ROMAGNOLE PRODUTOS ELETRICOS S/A

S&C ELECTRIC DO BRASIL LTDA

SADEFEM EQUIPAMENTOS E MONTAGENS S/A

SCHAK MATERIAIS ELETRICOS LTDA

SCHNEIDER ELECTRIC BRASIL

SCHNEIDER ELECTRIC BRASIL LTDA

SCHWEITZER ENG LAB COMERCIAL LTDA

SEG DO BRASIL ELETRO ELETRONICA LTDA

SERTA TRANSF IND COM IMP E EXP LTDA

SHIPEL EQUIPAMENTOS ELETRICOS LTDA

SIEMENS LTDA

SOLTRAN TRANSFORMADORES LTDA

SOPRANO ELETROMETALURGICA E

HIDRAUL LTDA

STEMAC S/A GRUPOS GERADORES

TOSHIBA SIST TRANSM DISTR DO BRASIL LTDA

TOSHIBA TRANSM E DISTR DO BRASIL LTDA

TRAFO EQUIPAMENTOS ELETRICOS S/A

TREETECH SISTEMAS DIGITAIS LTDA

TYCO ELECTRONICS BRASIL LTDA

VICENTINOS DO BRASIL PLATIC INJEC LTDA

VIJAI ELETRICA DO BRASIL LTDA

WARD ELETRO ELETRONICA LTDA

WEG S/A

WOBBEN WINDPOWER INDUSTRIA E COM LTDA

YASKAWA ELETRICO DO BRASIL LTDA

ZILMER INELTEC CONSTRUCOES ELETRS LTDA

Key Suppliers

The 2008 Brazilian foreign trade statistics table, published by the Foreign Trade Office of Bank of Brazil (SECEX), shows that the United States was Brazil's main supplier in the subsectors listed below. U.S. competitors are also noted in the table. Please note that the products listed in this table may include other industrial segments in Brazil. Brazil does not have a Free Trade Agreement (FTA) with the United States; thus, U.S. equipment suppliers are subject to regular import duties in Brazil. The import duty (ID) for electrical power equipment may vary from 0-18%. Other state and federal taxes apply to the importing process, a hypothetical sample of which is available from the U.S. Country Commercial Guide.

HS Code	HS Description	2008 Exports to Brazil (US$ million)	% Change from 2007	2008 U.S. % Market Share	2008 Competition	Import Duty	Exceptions (Expiration)
85013120	Photovoltaic Generator not superior to 750MW	2.5	-17.7%	48.7%	Argentina, France, Canada	18%	
8402	Steam Boilers/Heat Recovery Steam Generators	22.0	-84.6%	8.2%	Japan, France	14%	2% (12/31/09)
850231	Wind Power Generators	121.7	187.6%	11.6%	India, Germany, Colombia	14%	0%
840290	Heat Exchangers	13.3	-82.4%	9.5%	Slovakia, Germany, Poland	14%	
8404	Steam Condensers/Vapor Power Units	7.8	5.1%	19.0%	Finland, Austria, Japan	14%	2% (12/31/09)
8406	Steam/Vapor Turbines (and parts thereof)	38.8	82.7%	7.0%	Denmark, Japan, France	14%	2% (6/30/10)
841280	Aerogenerators for conversion of wind power into mechanical energy	1.6	13.4%	66.3%	Germany, Japan, Argentina	14%	
841381	Bomb for liquids, to be used in photovoltaic energy systems of continuous current, not above 2HP	27.1	35.0%	58.3%	Germany, China, Italy	14%	

841581	AC (for reversal of cooling/heating cycle)	7.3	28.1%	7.0%	China, Japan, Thailand, Austria	14%	
841861	Condensers/Heat Exchangers	1.3	-37.9%	11.0%	Italy, China, Denmark	18%	
841950	Heat Exchange Units	118.0	43.0%	18.6%	Germany, Sweden, China	14%	2% (12/31/09)
842131	Intake Air Filters	36.7	43.4%	33.1%	Japan, Germany, China	16%	
8501	Electric Motors and Generators	473.0	21.7%	20.4%	Germany, China, Thailand, Switzerland	18%	
8504	Transformers	833.2	30.9%	10.9%	China, Poland, Germany, Argentina	18%	
853620	Automatic Circuit Breakers, <= 1000 volts, molded case	76.4	45.6%	6.6%	Germany, China, France, Argentina, Hong Kong	18%	
853630	Other apparatus for protecting electrical circuits	16.7	23.6%	12.3%	Germany, China, Korea	16%	
853641	Tension relays <= 60 volts	60.2	21.2%	11.2%	Japan, China, Germany	16%	
853649	Relays = 60 volts	77.4	22.6%	20.2%	Germany, China, Sweden	16%	
8537	Electrical Controls	283.3	39.0%	21.3%	Japan, Germany, Spain, France	14%	

Source: Brazil Customs Service, Brazilian Secretary of External Commerce (SECEX)

Market Access

Domestic and foreign companies, either individually or in a consortium, are allowed to participate in the power generation auctions that ANEEL announces every year. All interested parties must meet the legal, fiscal, technical, financial and economic pre-qualification requirements set forth by ANEEL when it publishes the tenders.

To do business successfully in Brazil, CS Brazil encourages U.S. suppliers of power generation equipment and services to establish contacts with the Brazilian power generation companies; main equipment suppliers, as well as engineering and civil contractor companies for sub-contract and turnkey opportunities.

Large Brazilian engineering contractors include the following:

- Construtora Andrade Gutierrez: www.agsa.com.br
- Queiroz Galvao: www.queirozgalvao.com
- CBPO (Odebrecht Group): www.odebrecht.com.br
- Camargo Correa: www.cccc.camargocorrea.com.br

These contractors normally work on a turnkey basis and are frequently in charge of procurement for their own projects. U.S. suppliers of power equipment participating in bids issued by government-owned power companies, such as Furnas and Eletronorte, should be aware of existing public procurement laws. Price bidding and an association with a local Brazilian representative are required in all government projects. U.S. companies are encouraged to seek partnerships with local suppliers to establish after-sales technical support in Brazil. Please see the "Brazil Country Commercial Guide" (CCG), a U.S. Commercial Service publication or their websites for more details on government procurement and other relevant information on marketing U.S. products and services. These homepages also detail the business facilitation services available for U.S. companies by the U.S. Commercial Service in Brazil.

Upcoming Events

2009			
September	9-11	Denver, CO	6th US-Brazil Innovation Learning Lab http://www.compete.org/
	29-30	San Fransisco, CA	2nd Renewable Energy Finance Forum West (REFF West) http://reffwest.com/
October	27-29	Anaheim, CA	Solar Power International http://www.solarpowerinternational.com/
December	8-10	Las Vegas, NV	PowerGen International (68 renewable exhibitions) http://www.power-gen.com/index.html
2010			
February	23-25	Austin, TX	Renewable Energy North America Conference http://www.renewableenergyworld-events.com/index.html Photovoltaics World Conference http://www.pvworldevent.com/index.html
March	TBA	Washington, DC	2nd US-Brazil Innovation Summit http://www.compete.org/
April	26-30	São Paulo, Brazil	USCS Tradewinds Conference https://www2.focusbrazil.org.br
	TBA		Renewable Energy Finance Forum – Latin America http://www.euromoneyenergy.com
May	4-6	Atlanta, GA	WasteExpo 2010 http://www.wasteexpo.com
	18-20	Baltimore, MD	Electric PowerExpo 2010 http://www.electricpowerexpo.com/
	23-25	Dallas, TX	Wind Power 2010 (AWEA) www.windpowerexpo.org
August	10-13	Belo Horizonte, Brazil	ExpoMinas http://www.expominas.com.br/
2011			
June	TBA	São Paulo, Brazil	ElectronicAmericas

June	TBA	São Paulo, Brazil	ElectronicAmericas http://electronicamericas.com/en/home FIEE http://www.fiee.com.br/en/Home/

Web Resources

MME: http://www.mme.gov.br/mme
ANEEL: http://www.aneel.gov.br/
EPE: http://www.epe.gov.br/Paginas/default.aspx
SECEX: http://infosecex.desenvolvimento.gov.br/
ABINEE: http://www.abinee.org.br/ing/abinee/associa/gtdl.htm
ABEEolica: http://www.abeeolica.org.br/zpublisher/secoes/home.asp
ABEAMA: http://www.abeama.org.br/
Canal Energia: http://www.canalenergia.com.br/zpublisher/secoes/home.asp
USCS: http://www.export.gov
USCS Brazil:
https://www2.focusbrazil.org.br/siteUSA/index.aspx?link=industry/energy/index.html

Brazil Wind/Solar Assessment:
http://sonda.cptec.inpe.br/publicacoes/index.html
Brazil Country Commercial Guide:
http://www.buyusainfo.net/docs/x_3004529.pdf
UNEP Renewable Energy Report: http://www.ecodesenvolvimento.org.br/conexao-onu/brasil-e-o-maior-mercado-de-energia-renovavel/brasil-e-o-maior-mercado-de-energia-renovavel/brasil-e-o-maior-mercado-de-energia-renovavel/documentos/Global-trends-report-2009.pdf

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